City of Wilmington
Sanitary Sewer Condition Assessment Project – Rehabilitation Strategy and Capital Improvements Program
Report Summary

Recent sanitary sewer overflows (SSOs) in the City of Wilmington have demonstrated sufficient need for the City to evaluate the current condition of the wastewater collection system and actions that should be taken to improve the performance of the system. The City has also acknowledged that regulatory requirements for wastewater collection systems are becoming more stringent at the state and federal level, with a trend toward a zero-tolerance policy for "avoidable" SSOs – SSOs caused by inadequate management, operation, and maintenance. In response, the City has undertaken a number of initiatives to improve the integrity, operation, and overall performance of the City's wastewater collection system.

Acting on the initiatives to improve the wastewater collection system's performance, the City has undertaken an assessment of its current wastewater collection system program. The goal of the sewer system condition assessment is to create a plan of action for long term, on-going system rehabilitation and maintenance and to develop a recommended Capital Improvement Program (CIP) for implementing wastewater collection system projects to meet immediate needs as well as to continue funding the on-going condition assessment and rehabilitation programs. The following is a brief summary of the key points and recommendations in the *Rehabilitation Strategy and Capital Improvements Program Draft Report*.

- A sewer condition and criticality rating process was used to assess and prioritize system assets based on existing information. Ratings were developed for various factors that indicate criticality (consequence of failure) and condition (probability of failure). Assets which had indicators of poor condition and whose failure would potentially have the greatest impact on the community and environment were identified as high priority for further investigation or rehabilitation.

- Field investigations were performed on the high priority projects to verify the actual condition. Investigation included surge analysis, pipe wall thickness testing, visual inspection, air release valve (ARV) inspection, and other testing for three of the City's critical force mains. Investigation also included manhole and zoom camera inspection for three gravity sewer interceptors and two areas of downtown gravity collector sewer.

- The report outlines a framework for continued condition assessment to investigate the actual structural condition of the City's sewer system assets on a regular basis.

- An overall long-term rehabilitation strategy was developed with a goal of rehabilitating or replacing a minimum of 1.5 percent of the sewer annually. The strategy focuses the available resources and funding on the most immediate needs

as identified by the condition and criticality rating process and continued condition assessments.

- A recommended Capital Improvement Program (CIP) was developed for implementing wastewater collection system projects. The recommended CIP includes projects valued at an estimated $40,080,000 over the first five years (Phase 1) and $5.3 million per year after the first phase for the on-going rehabilitation and condition assessment programs. Details of the recommended CIP are provided in Table 1.

- Management, operations, and maintenance related capital improvement projects recommended in Phase 1 include:

  - A system-wide flow monitoring program
  - Hydraulic modeling & capacity analysis study
  - Geographic information system (GIS) and computerized maintenance management system (CMMS) updates.

- Specific rehabilitation/improvement projects recommended in Phase 1 include:

  - Replacement of ARVs and installation of surge control devices along the Pump Station 10, Pump Station 12, and River Road force mains
  - Rehabilitation of the collector sewers in portions of the downtown area
  - Rehabilitation of the Front Street Interceptor and South Greenfield Lake Outfall
  - Improvements to Pump Station 29
  - Replacement of the River Road force main.

- Continued condition assessment projects recommended in Phase 1 total $1.1 per year with the goal of determining the actual structural condition of all assets within the first 5 years. Thereafter, condition assessments would be conducted on approximately 10 percent of the length of sewer in the City's collection system per year.

Table 1: City of Wilmington Sanitary Sewer Collection System
10-Year Capital Improvements Program

PHASE I (2007-2012)

	Project Name	Description	Total Cost	*FY 07-08*	*FY 08-09*	*FY 09-10*	*FY 10-11*	*FY 11-12*
Rehabilitation and Other Projects								
1	System-wide Flow Monitoring	Installation of 22 temporary flow monitors throughout the collection system for a duration of 2 months & I/I analysis	$230,000	*$230,000*	-	-	-	-
2	Hydraulic Modeling/Capacity Analysis Study	Commission capacity analysis study of entire collection system including hydraulic modeling	$400,000	*$400,000*	-	-	-	-
3	GIS & CMMS Updates	Data Collection/Conversion Project	$1,000,000	*$200,000*	*$200,000*	*$200,000*	*$200,000*	*$200,000*
4	ARVs & Surge Control	Replacement/rehabilitation of ARVs and implement surge control	$1,560,000	*$1,560,000*	-	-	-	-
5	Downtown Rehabilitation - Sewershed 9	Rehabilitation of 36,250 ft of 6-inch through 15-inch pipe in sewershed 9	$7,600,000	*$7,600,000*		-	-	-
6	Downtown Rehabilitation - Sewershed 11	Rehabilitation of 33,260 ft of 6-inch through 12-inch pipe in sewershed 11	$6,660,000		*$6,660,000*	-	-	-
7	Downtown Rehabilitation - Sewershed 13A	Rehabilitation of 15,380 ft of 6-inch through 10-inch pipe in sewershed 13A	$3,080,000	-	-	*$3,080,000*	-	-
8	Front Street Interceptor Rehabilitation	Rehabilitation of 4,400 ft of 15 & 18-inch pipe between PS 13 & PS 14	$1,600,000	-	-	*$1,600,000*	-	-
9	South Greenfield Lake /PS14 Outfall Rehabilitation	Rehabilitation of 7,500 ft of 10-inch through 24-inch pipe south of Greenfield Lake	$2,250,000	-	-	*$2,250,000*	-	-
10	Pump Station 29 Improvements	Complete upgrade of pump station including controls. Suction line replacement.	$200,000	-	-	*$200,000*	-	-
11	Program Rehabilitation (River Road Force Main)	Replacement/rehabilitation of the River Road force main or other higher priority rehabilitation project	$10,000,000	-	-	-	*$5,000,000*	*$5,000,000*
		Subtotal	**$34,580,000**	***$9,990,000***	***$6,860,000***	***$7,330,000***	***$5,200,000***	***$5,200,000***
Continued Assessment Projects								
12	Trunk Sewer Condition Assessment	CCTV inspection of projects 1 through 11; zoom camera inspection of project 12	$750,000	*$150,000*	*$150,000*	*$150,000*	*$150,000*	*$150,000*
13	Collector Sewer Condition Assessment	CCTV inspection of projects 13 through 22; zoom camera inspection of projects 23 through 64	$2,800,000	*$560,000*	*$560,000*	*$560,000*	*$560,000*	*$560,000*
14	Force Main Condition Assessment	Leak inspection & ultrasonic testing of projects 65 through 78; leak inspection of projects 79 through 90	$1,950,000	*$390,000*	*$390,000*	*$390,000*	*$390,000*	*$390,000*
		Subtotal	**$5,500,000**	***$1,100,000***	***$1,100,000***	***$1,100,000***	***$1,100,000***	***$1,100,000***
		Total	**$40,080,000**	***$11,090,000***	***$7,960,000***	***$8,430,000***	***$6,300,000***	***$6,300,000***

PHASE II (2013-2017)

	Project Name	Description	Total Cost	*FY 13-14*	*FY 14-15*	*FY 15-16*	*FY 16-17*	*FY 17-18*
Rehabilitation and Other Projects								
1	Program Rehabilitation	Assume 40,000 ft of gravity sewer rehab projects or equivalent force main or pump station projects	$25,000,000	*$5,000,000*	*$5,000,000*	*$5,000,000*	*$5,000,000*	*$5,000,000*
Continued Assessment Projects								
2	Condition Assessment Program	Assume 38 miles (10%) of gravity sewer and/or force main per year	$1,500,000	*$300,000*	*$300,000*	*$300,000*	*$300,000*	*$300,000*
		Total	**$26,500,000**	***$5,300,000***	***$5,300,000***	***$5,300,000***	***$5,300,000***	***$5,300,000***

Note: All costs are given in 2006 dollars without escalation.